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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/826,851	04/06/2001	Toshiaki Kuniyasu	Q63956	3185

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11/06/2002

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EXAMINER

MENEFEE, JAMES A

ART UNIT

PAPER NUMBER

2828

DATE MAILED: 11/06/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/826,851

Applicant(s)

KUNIIYASU ET AL.

Examiner

James A. Menefee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 October 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 8-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 18-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.



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TECHNOLOGY CENTER 2800**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4. 6) ☐ Other: _____

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DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of group I, claims 1-7 and 18-21 in Paper No. 7 is acknowledged. Further, claim 22 has been cancelled. Claims 8-17 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 20 recites the limitation "the heat sink" in line 6. There is insufficient antecedent basis for this limitation in the claim. The term should read --a heat sink--.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b)

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only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Claims 1 and 6-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Kizuki (US 5,608,749).

Regarding claim 1, Kizuki discloses a semiconductor laser element comprising a substrate, a plurality of semiconductor layers 2-6 formed on the substrate, and a concave portion 8 formed on a surface of the substrate 1 opposite the side having the semiconductor layers 2-6 formed thereon, the concave portion 8 is filled with a metal having a heat conductivity higher than the substrate 1.

Regarding claim 6, a plurality of light-emitting portions are formed to form a laser array (Fig. 16).

Regarding claim 7, this claim is only reciting limitations drawn to the intended use of the device. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987).

Claims 1, 5, and 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Fujihara et al. (US 6,108,361).

Regarding claim 1, Fujihara discloses in Fig. 6D a semiconductor laser element comprising a substrate 501, a plurality of semiconductor layers 502+ formed on the substrate, and a concave portion 521 formed on a surface of the substrate 501 opposite the side having the

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semiconductor layers 502+ formed thereon, the concave portion 521 is filled with a metal having a heat conductivity higher than the substrate 521.

Regarding claim 5, contact block 527 acts as a heat sink and is connected to the metal filled in the concave section (Fig. 7).

Regarding claim 7, this claim is only reciting limitations drawn to the intended use of the device. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-3 are Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al. (US 6,281,524) in view of Fujihara. Yamamoto discloses the claimed invention as follows:

Regarding claim 2, Yamamoto discloses a semiconductor laser element having a substrate 201, a plurality of semiconductor layers 202+ disposed on the substrate 201, and a concave portion formed on a part of the semiconductor layers 202+ on the side furthest from the

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substrate 201 (Fig. 19). It is not disclosed that the concave portion is filled with a metal having higher heat conductivity than the semiconductor layer. Yamamoto does teach that the laser device is connected to a heat sink at the groove. Fujihara teaches that a laser device connected to a heat sink at a groove should have a metal having a higher heat conductivity than the surrounding portion fill the groove. It would have been obvious to one skilled in the art that the concave portion should be filled with a metal having a higher heat conductivity than the semiconductor layer, as this will provide a high heat release, as taught by Fujihara.

Regarding claim 3, the device is taught as in the rejection of claim 2 above, except there is further not taught that the substrate has a concave groove filled with a metal as in claim 1. Fujihara teaches this limitation as in the rejection of claim 1 above. It would have been obvious to one skilled in the art to include this metal filled groove in the substrate because it provides for improved heat release, as taught by Fujihara.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kizuki or Fujihara. Kizuki and Fujihara disclose the limitations of the claims as shown above, but do not teach that the concave groove has a reverse mesa structure. It has been held that a mere change in shape is an obvious engineering design choice. Since changing the shape would not significantly change the operation of the device, it would have been obvious to one skilled in the art to change the shape of the concave groove to a reverse mesa. *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

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Claims 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawai. (US 6,239,033). Kawai discloses a device comprising a substrate 51, a semiconductor layer 52-59 including an active layer 56 and formed on the substrate 51, and one of a pair of electrodes 60,62 is formed on each of the substrate 51 and the semiconductor layer 52-59. There is inherently a current injection region because the device is electrically pumped. There is a groove 61 formed on the substrate on the side furthest from the semiconductor layer, said groove 61 reaching the depth of the semiconductor layer 52-59. The electrode 62 is formed on the surface of the groove 61. Kawai does not disclose that the structure is made of the materials as claimed. However, parts of a laser device are often made of the materials as claimed. It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the substrate of GaN and the semiconductor layer with a GaN base, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawai as applied to claims 18-19 above, and further in view of Fujihara. Kawai teaches the limitations of claims 18-19 as shown above, but does not teach that the groove is filled with a metal, specifically gold, where the surface of the groove is flattened and a heat sink is formed thereon. Fujihara teaches a substrate to a laser device that contains a concave groove thereon that is filled with gold and is flat. A heat sink is connected through the groove to the substrate of the laser device (see Fig. 7). It would have been obvious to one skilled in the art to connect the laser

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device to a heat sink so that heat release is improved, thus suppressing output saturation, as taught by Fujihara.

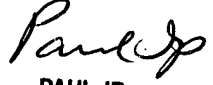
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Menefee whose telephone number is (703) 605-4367. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (703) 308-3098. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JM
October 25, 2002


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